Departmental investigation into the collision between the fishing vessel EXTERMINATOR and the Liberian tanker UNISINA

off the southern coast of NSW on 25 April 1997







#### Report No. 116



AUSTRALIA Department of Workplace Relations and Small Business

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Navigation Act 1912 Navigation (Marine Casualty) Regulations investigation into the collision between the fishing vessel EXTERMINATOR and the Liberian tanker UNISINA off the southern coast of NSW on 25 April 1997

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### Summary

Early on 25 April 1997, the Australian steel hulled, long-line fishing vessel *Exterminator* was repositioning to the south, before shooting its line, about 19 miles east by south of Green Point, New South Wales. The Skipper was on watch in the wheelhouse and had noticed, on the radar, a vessel coming up from astern, shaping to pass clear on the port side.

Suddenly, at about 0040, there was a loud bang and a jolt and the Skipper was thrown to the deck on the port side of the wheelhouse as *Exterminator* rolled heavily to port. Pulling himself back to a standing position, the Skipper saw the hull of a large vessel, in a light condition, passing up the fishing vessel's starboard side. As *Exterminator* rocked as a result of the initial collision, it came into contact twice more with the hull of the other vessel.

The Skipper put out a number of calls on VHF16, but received no response. He reported the collision to AMSA, then, after contacting the owner, returned to Eden to assess the damage.

The 110,461 tonnes deadweight Liberian tanker *Unisina* had sailed, in ballast, from Gore Bay, Sydney, on the morning of 24 April 1997, bound for the *FPSO Cossack Pioneer*, located on the Northwest Shelf.

At midnight on 24 April, the vessel was in a position 20.5 miles east of Green Cape, making good a speed of 11.6 knots on a course of 196°. Shortly after 0030, the officer of the watch started altering course slowly to starboard for a vessel, which he considered to be northbound and crossing from starboard to port. After about five minutes and with the ship heading about 235°, the officer applied hard to starboard rudder, then port rudder, in an apparent attempt to avoid a collision.

Scientific comparison by the Australian Federal Police Scientific Branch matched paint taken from the hull of *Unisina* with paint deposited on *Exterminator*, indicating that *Unisina* was the vessel that collided with the fishing vessel.

## **Sources of Information**

Skipper of FV Exterminator

Master, Mate, Second Mate and Third Mate, Unisina

Master, Mate, Second Mate and Third Mate, Pathfinder II

Master, Global Star

### Acknowledgement

The Inspector wishes to acknowledge the assistance provided by the Australian Federal Police Scientific Branch, Canberra; the Australian Maritime Safety Authority, Melbourne; the Maritime Safety Inspectorate of the Swedish Maritime Administration; and the New South Wales Police, Eden.

Portion of chart Aus 359 reproduced by permission of the Hydrographic Office, RAN.

### Narrative

#### Exterminator

Of all steel construction, the long-line fishing vessel *Exterminator* was built in Korea in 1990 and was purchased by an Eden based consortium in 1995. The vessel has an overall length of 34.03 m, a beam of 5.8 m and a moulded depth of 2.5 m. A mid-length deckhouse contains the wheelhouse and skipper's cabin and is surmounted by a tripod signal mast, supporting the masthead light, the fishing signal lights and the radar scanner. The vessel has a raised forecastle and a raised poop. A short steel post atop the poop supports the stern light and a deck floodlight. Navigation equipment includes a gyro compass, autopilot, radar and GPS.

Manned by a crew of five, comprised of a skipper, a mate, an engineer and two hands, the vessel normally stays at sea for a week at a time, returning to Eden to land the catch at the end of each week. One line is used, up to 16 miles in length, supported by floats spaced at 500 yards (457 m) and marked by radio beacon/light buoys every three miles. The hooks are suspended at depths varying between 10 m and 40 m.

*Exterminator* sailed from Eden at 1100 on Wednesday 23 April and the line was shot away that evening, about 20 miles eastward of Gabo Island. The line was left set all night, then hauled the next day, starting at 0800 and completing at 1900. The crew then had their dinner and went to bed.

The Skipper had slept during the day, while the crew were hauling in the line, so as to be able to take the watch during the night. Initially, he headed in a northerly direction, but at around 2200/2230, he decided to head back south and brought *Exterminator* to a heading of 190° True. The speed, from the GPS, was 4.3 knots. *Exterminator* was exhibiting the requisite navigation lights (masthead, sidelights and stern light) and, although not actively engaged in fishing, the red over white, all-round, fishing signal lights. The deck floodlights were also said to be on, one 1500w floodlight on the sternlight post, directed forward, two 1500w floodlights and one 400w sodium fluorescent light on the signal mast, directed to the well deck, forward of the deckhouse.

Initially, there had been a number of other ships around, but after turning to head south it became quiet, apart from the fishing vessel *Terminator*, also headed south a few miles to the west. The wind was south-westerly at 10

knots, the sea and swell at about one metre; the sky was overcast, but the weather was fine and clear, with 8-10 miles visibility.

To help pass the time, the Skipper read a newspaper, spread out on the table at the forward end of the wheelhouse and had put the wheelhouse lights on so as to be able to do so. Shortly after midnight, the Skipper used his mobile telephone to speak to the skipper of *Terminator*, who said that there was another ship approaching from the north. The Skipper changed the radar range to the 6-mile range and saw the echo of a vessel about four miles on the port quarter. From the radar, it appeared the vessel would pass clear to port, but the Skipper adjusted course to 195°, to make for a greater passing distance. At a distance of about two miles, the other vessel still appeared to be passing clear to port and the Skipper returned to his paper.

Suddenly there was a loud bang and the Skipper was thrown to the deck, on the port side of the wheelhouse, as *Exterminator* heeled heavily to port. He hauled himself upright and saw the red boot-topping and black topside of a large vessel as it passed up the starboard side of *Exterminator*. He immediately switched the autopilot to manual steering and put the engine out of gear. As *Exterminator* rolled as a result of the initial contact, the top of the starboard side of the deck house came in contact with the side of the vessel and then, with the second roll to starboard, the starboard side of the forecastle made contact. The crew, woken by the collision, scrambled up on deck and told the Skipper that their cabin portholes (about two metres above the waterline) had been submerged when *Exterminator* had heeled over.

As soon as the vessel had passed clear, the Skipper called the *Terminator* on VHF channel 10 and informed that skipper of the collision. He then changed to channel 16 and put out the call "Steamer vessel in position 37 22 south 150 24 east, do you copy? This is fishing vessel *Exterminator*". He made this call four times, but received no response. The vessel appeared to slow down and change course so as to show its starboard sidelight, but then continued on its way. The Skipper then tried calling another vessel, out on the starboard quarter, but again received no response.

The skipper of the *Terminator* called him and gave him the telephone number of AMSA and he reported the collision to the Authority, after which he telephoned the owner. Although the damage appeared not to be severe and above the maindeck level, the owner advised him to head back to Eden, where *Exterminator* arrived at 0500.

#### **Pathfinder II**

The Liberian bulk carrier *Pathfinder II* was on passage from Vancouver, British Columbia, to the Alcoa berth at Point Henry in Port Phillip Bay. At 0040 on 25 April, *Pathfinder II* was in a position 34½ miles east by south of Green Cape, steering a course of 228° and making good a speed of 13.7 knots.

The officer of the watch heard a fishing vessel calling a southbound vessel on VHF channel 16 and giving the position 37 21 south 150 23 east. The radar screen showed two large targets about 45° on the starboard bow at a distance of about 17 or 18 miles. The two targets were about six miles apart, moving in a south-south-westerly direction, with the rear vessel slowly overtaking the lead vessel. The officer of the watch plotted the position given by the fishing vessel and the relative positions of the two radar targets, which indicated the lead vessel to be the closer of the two vessels to the fishing vessel's position.

The lead vessel crossed ahead of *Pathfinder II* at about 0200 and passed out of visual range to the south as *Pathfinder II* progressed into the Bass Strait. *Pathfinder II* overtook the second vessel in the traffic separation scheme to the south of the Bass Strait oil fields. This proved to be the Panamanian bulk carrier *Global Star*, on a loaded passage from Gladstone, Queensland to Oxelsund, Sweden. During a VHF exchange, during which requests from MRCC Canberra for position, course and speed reports at 0040 were discussed, *Global Star* informed *Pathfinder II* that *Global Star* had been a long way from the fishing vessel incident.

### Unisina

*Unisina* is a 110,461 tonnes deadweight, Liberian flag oil tanker built at Rijeka, Croatia in 1994 and has an overall length of 246.92 m, a beam of 42.84 m and a moulded depth of 20.706 m. The vessel is operated by Estoril Navigation Company Limited of Piraeus, Greece, which employs a Greek master, Croatian officers and a combination of Croatian and Ukrainian ratings.

The vessel berthed at the Shell Australia terminal at Gore Bay, Sydney, on 21 April 1995, to discharge a cargo of crude oil. Following normal onboard in-port procedures, the Second and Third Mates worked six-hour watches.

On Tuesday 22 April, a new Second Officer joined the vessel, having departed from his home in Rijeka on the Sunday morning. He was met at Sydney airport by the agent, who took him straight to the vessel and he arrived

on board at 1000. He took up watch keeping duties at noon.

Cargo discharge completed at 0055 on 24 April and *Unisina* sailed from the berth, in ballast, at 0620, bound for the Floating Production Storage Offloading vessel *Cossack Pioneer*, located on the Australian Northwest Shelf. The draught was 5.8 m forward and 9.8 m aft. The pilot disembarked at 0715, "full away" on passage was rung at 0800 and the vessel was brought onto course 196°, for the way point off Gabo Island.

That night, the Second Mate, following his normal routine, was called at 2300, took a shower to freshen up, and went to the bridge at 2350. The Third Mate handed over the watch at midnight, at which time *Unisina* was still on the

196° course, 20.5 miles east of Green Cape and making good a speed of 11.6 knots. The wind was from the south, force six, the sea rough and the sky cloudy, but the visibility was good and there were no other ships close to *Unisina*. The VHF was switched to channel 16, with the volume set so as to be easily audible should there be any traffic.

The recollection of the Third Mate was that after handing over the watch, he had remained on the bridge talking to the Second Mate, drinking a cup of coffee and smoking a cigarette. He left the bridge at 0030, at which time there were no other vessels close to *Unisina*. However, the Second Mate recalled that the Third Mate had left the bridge at 0007 and he pointed out that there was only one cup on the bridge, so that they could not "socialise" drinking coffee.

At sometime around 0030, the Second Mate observed the lights of another vessel between 25° and 30° on the starboard bow. From the lights he could see, he concluded that it was a northbound vessel crossing to port and, after some minutes, he made a large alteration of course to starboard, to pass port to port and to make his "giving way" actions obvious to the other vessel. When the other vessel had passed, he brought *Unisina* back to the 196° course.

At 0215, *Unisina* arrived at the way-point off Gabo Island and the Second Mate altered course to 235°. However, as a vessel was overtaking on the starboard quarter, he altered course back to port, to avoid a close quarter situation. Once the other vessel was clear, he brought *Unisina* onto a course of 224°, a course that would take the vessel well to the south of the usual route through the Bass Strait.

When handing over the watch to the Mate, at 0400, the Second Mate made no mention of any close encounters with other vessels.

The Master and officers were interviewed when Unisina returned to Gore Bay on 30 May 1997.

### **Comment and Analysis**

### Identification of the vessel involved

Examination of *Unisina's* deck log book and navigation charts shows that, without any deviation from the logged course, at 0040 on 25 April 1997, *Unisina* was within four cables eastward of the collision position provided by *Exterminator*.

*Unisina's* course recorder chart shows that at 0033, *Unisina*, on a heading of 195°, commenced an alteration of course to starboard, to 270° at 0040, after which there was a swing to port, back to 195° at 0045.

From the subsequent courses steered by *Unisina*, it is evident that *Unisina* was the vessel observed on *Pathfinder II's* radar to have been close to the reported collision position.



Portion of chart Aus 359 showing positions of vessels

Paint samples taken from the vessels known to have been in the area of the collision were compared by the Scientific Branch of the Australian Federal Police with samples of the paint deposited on *Exterminator*. This scientific comparison, involving microscopic search and infra-red spectroscopy, matched three layered paint chips taken from the hull of *Unisina* with the deposited paint (See Attachment 1).

From all of the evidence, it is apparent that *Unisina* was the vessel that collided with *Exterminator* at 0040 on 25 April 1997.

#### Analysis

At midnight, when the Second Mate took over from the Third Mate, *Exterminator* would have been about 6° on the starboard bow at a distance of 4.6 miles and should have been clearly visible from the bridge of *Unisina*. The relative bearing of *Exterminator* would then have opened to starboard, initially quite slowly, but more quickly as the distance between the two vessels decreased. At 0015, *Exterminator* would have been 7° on the starboard bow at a distance of 2.9 miles and at 0030, 20° on the starboard bow at a distance of 1.22 miles. At 0033, when the Second Mate started to alter course slowly to starboard, *Exterminator* would have been 30° on the starboard bow, at a distance of only eight cables.

Observation of the relative bearing of the lights over a period of time would have indicated that the bearing was opening, particularly had the lights been seen right from the start of the watch. However, the Second Mate said that when he saw the lights, they were between 25° and 30° on the bow. It is therefore apparent that he had not kept a lookout until shortly before altering course to starboard at 0033.

At the time the Second Mate saw the lights, *Exterminator* would have been within one mile of *Unisina* and should have been well illuminated by its decklights. Therefore, it should have been plainly visible and obvious what it was. However, the Second Mate mistook the lights he saw to be those of a large northbound vessel crossing to port and still at some distance. This would indicate that *Exterminator* did not, in fact, have its deck lights switched on.

The course recorder chart indicates that at 0033, *Unisina* started to change course to starboard from a heading of 195° and, at 0038½, had reached a heading of 236°, a rate of change of only 7½° per minute. During this time, *Unisina* would have advanced 1.45 miles. There was then a rapid swing to starboard, to 260° at 0039, indicating the helm had been put hard to starboard at 0038½, followed by a reduced rate of change to 270° at 0040, after which the vessel swung back to port and was back on the 195° course at 0045.

#### **Consideration of the Unisina Second Mate's actions**

At interview, the Second Mate stated that, at the time in question, he did not see any fishing vessels close to *Unisina*, did not collide with a fishing vessel and did not hear a fishing vessel calling on VHF channel 16.

Although an AB was assigned to the watch, the evidence he provided raised doubt on whether he was in fact on the bridge, and not just "on call".

The Second Mate had gone to the bridge at 2350 and had taken over the watch at midnight. However, it is apparent that he did not see the lights of *Exterminator* on the starboard bow until, or after, 0030. The Second and Third Mates provided different accounts of the time the Third Mate left the bridge after the handover of the watch, the latter stating the time to be 0030. It is considered that, in all probability, the two officers remained talking, behind the chart table, until about that time. This would account for the Second Mate not seeing *Exterminator* earlier and observing the increase in relative bearing.

Relying purely on visual assessment, over a short period of time, the Second Mate concluded the lights he could see were those of a northbound vessel showing a red sidelight, still at a fair distance. He did not take visual bearings, or use the radar to confirm whether a risk of collision existed, instead, after a fairly quick assessment, he started an unhurried alteration of course to starboard, to place the other vessel on the port bow.



Portion of Unisina course recorder chart showing the alteration of course to starboard shortly before 0040 From the evidence of the course recorder chart it is apparent that, at 0038, the Second Mate suddenly found that the lights had not been those of a northbound vessel at a distance, but those of a small vessel at much closer range and he had to apply first hard to starboard and then hard to port wheel in an attempt to avoid collision. Whereas it would be normal for the initial alteration to starboard to have been made in autopilot, by the Second Mate, the AB does not appear to have been put on the wheel for these manoeuvres.

At light draught, with a freeboard midships of 12.9 m, it is possible that the Second Mate, at the wheel position, did not see *Unisina* actually collide with *Exterminator*. If not, and if he did not hear sounds of impact, he may have felt that his actions had been successful in avoiding actual collision.

If the Second Mate was aware that the two vessels had collided, then he was under an obligation to make contact with the other vessel, to ascertain what damage had been done, whether assistance was required and to exchange details. Even if he thought it to have been a very near miss, it would have still been appropriate for him to have made VHF contact with the other vessel, to ascertain that no damage had been caused and no one injured.

The Second Mate made no sound signals, required by rule 34 of the Colregs<sup>1</sup>, to indicate his actions. A sound signal made at 0033 may have been heard by the Skipper of *Exterminator* and alerted him to the situation, while a sound signal made at 0038<sup>1</sup>/<sub>2</sub> may have been in sufficient time to alert the Skipper and enabled him to veer away.

#### Fatigue/jet-lag/reduced alertness

The *Exterminator's* Skipper stated that his vessel was exhibiting steaming lights, masthead, sidelights and stern light, plus red over white all-round fishing signal lights, which he displayed at all times, even when not actively engaged in fishing. Therefore, the lights that would have been visible to the Second Mate on *Unisina* were the red over white all-round lights and the stern light, with the latter below and slightly to the right of the former.

The Second Mate had left his home in Rijeka on the morning of 20 April to fly to Sydney, via Zagreb, Prague and Singapore. He arrived in Sydney at 0800 on 22 April and, instead of being taken to an hotel for a recuperation

period, he was taken straight to the ship, arriving on board at 1000. He had been travelling for about 39 hours, during which he would have had little revitalizing slow-wave deep sleep<sup>2</sup>, and had experienced a nine-hour time shift. He had, therefore, arrived on board with a sleep debt and with his bodily circadian rhythms nine hours out of tune with the local environment.

After a brief "moving in" and lunch, he turned-to at midday, on a six hour watch routine, which lasted until noon on

24 April. Whereas theoretically the six-hour watch routine would provide sufficient sleep, it would probably not completely eradicate the sleep debt occasioned by the travelling, or help the body to adjust to the different time zone.

It is considered most probable that when he took over the watch at midnight on

24 April, the Second Mate still had a certain sleep debt and was still not fully attuned to the local time. Both of these factors were likely to have impaired his level of alertness, and could account for an experienced officer wrongly interpreting a set of lights and misjudging their distance.

#### **STCW** Convention

Regulation VIII/1 (Fitness for Duty) of the STCW Code requires that:

Each Adminstration shall, for the purposes of preventing fatigue:

- 1. establish and enforce rest periods for watchkeeping personnel: and
- 2. require that watch systems are so arranged that the efficiency of all watchkeeping personnel is not impaired by fatigue and that duties are so organized that the first watch at the commencement of a voyage and subsequent relieving watches are sufficiently rested and otherwise fit for duty.

Although the Code stipulates that watch personnel should be sufficiently rested and otherwise fit for duty before taking over a watch, and stipulates minimum rest periods (Section A-VIII/1), there is nothing specific about appropriate rest periods following long distance travel. However, regulations or guidelines for rest periods are clearly delegated, under Regulation VIII/1, to the Administration responsible for the vessel, ie. the Flag State.

This delegation appears to have created a grey area, with Administrations directing that ship owners shall comply with the Code, without providing particular guidelines on appropriate rest periods after long distance travel when joining a vessel. In the absence of guidelines within the Code, responsibility lies with the Administration and should not be further delegated to the owners or masters.

### **Consideration of Exterminator**

According to the Skipper, he exhibited the fishing signal lights at all times, even when not fishing. This custom is contrary to the regulations (Colregs Rule 26(e)) and in this instance contibuted to the watch officer aboard *Unisina* mistaking the lights he saw for those of a northbound, crossing vessel.

Although on watch in the wheelhouse, the Skipper was reading a newspaper and therefore not giving his full attention to his duties and responsibilities of keeping a proper lookout (Colregs Rule 5). His last recollection of the radar distance of *Unisina* was two miles, which equates to 16½ minutes before the collision.

As a vessel being overtaken, *Exterminator's* duty was to maintain course and speed (Colregs Rule 17(a)(1)). However, the Skipper also had a responsibility to fully monitor the situation and also to take appropriate action when collision became evident (Colregs Rule 17(b)). By not monitoring the situation, the skipper was unaware that the vessel overtaking him was altering course towards *Exterminator* and that collision was imminent.

The design of the midship deck-housing of *Exterminator*, with the skipper's cabin immediately aft of the wheelhouse and accessed by a door in the port side of the wheelhouse, does not provide good visibility out on the port quarter from the wheelhouse. Access to the wheelhouse is by a door on the starboard side. In order to observe the overtaking vessel visually, the Skipper would have had to go out of the wheelhouse and, either go right aft, or go to the port side aft of the deckhousing, neither of which is satisfactory.

## Conclusions

These conclusions identify the different factors contributing to the incident and should not be read as apportioning blame or liability to any particular organisation or individual.

*Unisina* collided with *Exterminator* after the Watch Officer mistook the lights of *Exterminator* to be those of a more distant, crossing vessel and altered course towards the fishing vessel.

The following factors are considered to have contributed to the incident:

- A proper lookout was not maintained on the bridge of *Unisina* between midnight and 0030.
- A proper appraisal of the situation was not carried out by the Watch Officer, by using either visual bearings or radar, before he altered course to starboard.
- Reduced alertness on the part of the Watch Officer, brought about by a sleep debt and "jet lag".
- The absence of any guidelines to owners and operators by the Flag Administation, or instructions to masters by the vessel's operator, on rest period requirements to overcome the effects of long distance travel prior to joining a vessel.
- A proper lookout was not maintained on *Exterminator*.
- The inappropriate display of fishing signal lights by *Exterminator*.

## Submissions

Under sub-regulation 16(3) of the Navigation (Marine Casualty) Regulations, if a report, or part of a report, relates to a person's affairs to a material extent, the Inspector must, if it is reasonable to do so, give that person a copy of the report or the relevant part of the report. Sub-regulation 16(4) provides that such a person may provide written comments or information relating to the report.

The final draft of the report was sent to the following:

Skipper of FV Exterminator

Master and Second Mate of Unisina

No submissions or comments were received.

# **Details of Exterminator**

Flag	Australian
Ship type	Fishing vessel
Construction	Steel
Year of build	1990
Place	Korea
Length overall	34.03 m
Beam	5.8 m
Depth moulded	2.5 m
Crew	5

## **Details of Unisina**

IMO No.	8919075
Flag	Liberian
<b>Classification Society</b>	Lloyds Register of Shipping
Ship type	Oil Tanker
Owner	Unisina Navigation Co.
Operator	Estoril Navigation Co Ltd Piraeus, Greece
Year of build	1994
Builder	Brodogradiliste, Rijeka
Gross tonnage	58,091
Net tonnage	37,257
Summer deadweight	110,461 tonnes
Length overall	246.92 m
Beam	42.84 m
Draught (summer)	15.524 m
Engine	5 cylinder Sulzer
Engine power	10,550 kW
Crew	26 (Greek master, Croatian and Ukrainian officers and crew)

#### **Report of Scientific Branch, Australian Federal Police**

#### **Examination & Interpretation**

- The examination involved a microscopic search of ship scale and paint samples. Paint colour, aspect and layer sequences were recorded by means of sketches, hand written notes, and photomicrographs.
  - The search revealed evidence of a one way transfer of paint chips from the ship "UNISINA" to the fishing vessel "EXTERMINATOR". These chips comprised a colour sequence of yellow, dark brown, and brick red. The layers appeared to have similar hues and thickness. No significant differences were detected between paint chips recovered from the "EXTERMINATOR" and paint from the "UNISINA".
- The individual layers of paint chips that were presumed to have been transferred from the "Unisina" to the "Exterminator" were further examined using infra-red spectroscopy. No significant differences were detected in the yellow, dark brown and brick red layers between the samples from both sources.
- Scale and paint samples from the motor vessels "PATHFINDER" and "GLOBAL STAR" were examined and excluded as possible sources.

#### Conclusion

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- Strong evidence was found to support the proposition that the ship "Unisina" had collided with the fishing vessel "Exterminator".
- This evidence was in the form of a one way transfer of paint chips from *"Unisina"* to *"Exterminator"*. The evidence was considered strong because the paint chips exhibited unusual features of a three layered colour sequence, which were indistinguishable by visual appearance and polymer matrix composition as determined by infra-red spectroscopy.
- Paint from motor vessels "PATHFINDER" and "GLOBAL STAR" were examined and excluded as possible sources.